

NON-PUBLIC?: N  
ACCESSION #: 9110030152  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: LaSalle County Station Unit 2 PAGE: 1 OF 04

DOCKET NUMBER: 05000374

TITLE: Manual Scram Due to Electro-Hydraulic Control Leak  
EVENT DATE: 09/06/91 LER #: 91-010-00 REPORT DATE: 09/30/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 032

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Joseph Tokarz, Technical Staff TELEPHONE: (815) 357-6761  
Engineer, Extension 2875

COMPONENT FAILURE DESCRIPTION:  
CAUSE: X SYSTEM: TG COMPONENT: MANUFACTURER:  
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

#### ABSTRACT:

At 0415 hours, on September 6, 1991, with Unit 2 in Operational Condition One (RUN) at 85% power (965 MWe), the Electro-Hydraulic Control (EHC, EH)TG! Fluid Tank Hi/Lo level alarm annunciated after all four Main Turbine Control Valves had been cycled for required monthly Reactor Protection Surveillances.

A local investigation found that the EHC tank level was low. Also an EHC hydraulic oil leak was discovered at the #2 Main Turbine Control Valve. At 0525 hours, when it became apparent that the leak could not be controlled, a Unit shutdown was initiated. The reactor was manually scrammed at 0615 hours, from 32% power (361 MWe). Following the manual Scram, the turbine automatically tripped, on Main Generator reverse power. The leak stopped when the turbine tripped.

One leak was found at the half inch stainless steel tubing which supplies

1600 psig Relayed Emergency Trip System (RETS) hydraulic fluid to the #2 Control Valve. The cause of the leak has been attributed to broken and damaged piping supports that allowed the EHC lines to vibrate excessively. The damaged supports, allowed the RETS line and the 1 inch stainless steel tubing that supplies the 1600 psig Fluid Actuation Supply (FAS) to the #2 Main Turbine Control Valve to rub together, resulting in the failure of the RETS line. It was also identified that the RETS and FAS lines for the #4 Main Turbine Control Valve were also rubbing together. This had resulted in outer diameter wall thinning on the RETS line, however, no leakage occurred.

The hydraulic lines of #2 and #4 Control Valves were repaired. Four mechanical snubbers sprayed with fluid were replaced. All fluid soaked steam line insulation was replaced. All electrical cable jackets affected as well as the general area were cleaned. Repairs to the pipe supports recommended by the Nuclear Engineering Department were completed.

During the course of the event, 12 barrels of EHC fluid were added to restore the EHC reservoir to its normal level. The Mark I EHC system was supplied by General Electric. This event is reportable pursuant to the requirements of 10CFR50.73(a)(2)(iv) due to a manual actuation of the Reactor Protection System.

END OF ABSTRACT

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## PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as XX!.

### A. CONDITION PRIOR TO EVENT

Unit(s) : 2 Event Date: 09/06/91 Event Time: 0415 Hours

Reactor Mode(s): 1 Mode(s) Name: Run Power Level(s): 85%

### B. DESCRIPTION OF EVENT

At 0415 hours, on September 6, 1991, with Unit 2 in Operational Condition One (RUN) at 85% power (965 We), the Electro-Hydraulic Control (EHC)TG! Fluid Tank Hi/Lo Level Alarm annunciated after all

four Main Turbine Control Valves were cycled. They were being cycled in accordance with LaSalle Operating Surveillance LOS-RP-M4, "Turbine Control Monthly Surveillance". A local investigation determined that the EHC fluid tank level was low. An entry into the heater bay revealed that the EHC System was leaking near the #2 Main Turbine Control Valve. At 0525 hours, when it became apparent that the leak could not be controlled, a normal unit shutdown was initiated. The shutdown was performed in accordance with LaSalle General Procedure LGP-2-1, "Normal Unit Shutdown". Since EHC fluid inventory was rapidly being depleted, the reactor was manually scrammed at 0615 hours, from 32% power (361 MWe) to ensure EHC System availability for reactor pressure control. The scram was completed in accordance with LGP-3-2, "Reactor Scram". Following the manual scram, the turbine automatically tripped on generator reverse power. The leak stopped when the turbine tripped, as anticipated.

### C. APPARENT CAUSE OF EVENT

An inspection of the #2 Main Turbine Control Valve, after the EHC leak stopped, revealed that its half inch stainless steel 1600 psig Relayed Emergency Trip System (RETS) supply line had failed. This line had been rubbing against the 1 inch 1600 psig Fluid Actuation Supply (FAS) line of the #2 Main Turbine Control Valve. The FAS line showed thinning of its outer diameter at the point of contact. It was also identified that the RETS and FAS lines for the #4 Main Turbine Control Valve had been rubbing together. This had resulted in outer diameter wall thinning on the RETS line, however, no leakage occurred.

Fourteen EHC Hydraulic Line Pipe Supports were found to be damaged. Four of the supports were near the Control Valves while the others were on the lines which supplied both the Stop and Control Valves. These damaged supports allowed the RETS and FAS lines to vibrate excessively and to rub together eventually causing the leak near the #2 Control Valve.

It is believed the hangars were damaged on April 19, 1991, when the bypass and control valves cycled during a 511 millisecond transient attributed to possible radio frequency interference. This was reported in Deviation Report (DVR) 01-02-91-014. In addition to being located at the end of a RETS/FAS piping run, the #2 and #4 Control Valves have a larger capacity servo valve that may have contributed to their larger valve motion during this short transient.

#### D. SAFETY ANALYSIS OF EVENT

The safety significance was minimal. No Technical Specifications were exceeded. PCIS Groups 6 and 7 isolated as expected during the scram. There were no abnormal alarms. Reactor Core Isolation Cooling (RCIC)(RI)BN! was not required and no Safety Relief Valves (NB)SB! operated.

Had the leak been on the FAS line, the EHC pump would have been shutdown to stop the leak, in which case the bypass valves would have stayed closed after a turbine trip. Bypass valve failure to operate during a turbine trip is an analyzed event which is evaluated in the Updated Final Safety Analysis Report (UFSAR) and does not compromise the safety limits.

The EHC system, including the bypass valves, is Non-Safety Related.

#### E. CORRECTIVE ACTIONS

The entire hydraulic system was inspected and Non-Destructive Examinations (NDE) were performed at locations specified by the Nuclear Engineering Department (NED). All NDE were either by Visual Testing or by measuring the tubing's outside diameter with a micrometer.

A section of piping was replaced to repair the RETS lines of #2 and #4 Control Valves and the FAS line of #2 Control Valve. This work was done in accordance with Work Request L09902.

Since EHC fluid had been sprayed on several mechanical snubbers and the Main Steam Line (MS)SB! insulation, a complete area inspection was performed.

All fluid soaked insulation, including a charred piece of blanket insulation from a Main Steam line elbow, was replaced. This work was performed by Work Request L09910 as recommended in General Electric's Turbine Information Letter (TIL) 868-3. Although the EHC fluid (Fyrquel) is fire resistant, it cannot be considered non-flammable.

Four mechanical snubbers sprayed with EHC fluid were replaced. This was at the recommendation of the off-site NED (Chron 113929). The work was performed by Work Request L09961, L09962, L09963 and L09964.

Four damaged EHC pipe supports were removed by Work Request L09911. This task was completed in accordance with Temporary System Change (TSC) 2-238-91 and will become permanent when Minor Change (MC) 1-2-90-029 is complete. These supports were to be removed by this Minor Change. This TSC has been approved by the NED (Chron 113927).

Ten additional damaged EHC pipe supports were replaced by Work Request L09911.

All electrical cable insulation as well as the entire area was cleaned.

An inspection was also made of Unit One's hydraulic system. The FAS line of #3 Control Valve and the drain line of #1 Control Valve were shielded with a copper sheath.

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#### E. CORRECTIVE ACTION (CONTINUED)

The following actions to prevent recurrence of this event will be taken:

1. The recommendations of General Electric TIL-733," Eliminating Stop Valve and EHC Hydraulic Line Vibration During Prewarming", will be evaluated. AIR 374-180-91-03801 will track completion of this evaluation.
2. Conduct a hydraulic system inspection while the system is hot for EHC System leakage, piping support integrity and potential problem areas where the piping is rubbing against other parts of the system. These inspections will be performed on Units 1 and 2, during shutdown and startup of the next Refuel Outages. AIR 374-180-91-03802 will track the completion of these inspections.

#### F. PREVIOUS EVENTS

Although no pipe breaks have occurred, broken supports have occurred on Unit 1. A minor modification has since changed the piping supporting scheme. This has been done by Minor Change 1-1-90-027.

#### G. COMPONENT FAILURE DATA

The Mark I EHC system was supplied by General Electric.

ATTACHMENT 1 TO 9110030152 PAGE 1 OF 1

Commonwealth Edison  
LaSalle County Nuclear Station  
Rural Route #1, Box 220  
Marseilles, Illinois 61341  
Telephone 815/357-6761

September 27, 1991

Director of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #90-010-00, Docket #050-374 is being submitted to your office in accordance with 10CFR50.73(a)(2)(iv).

G. J. Diederich  
Station Manager  
LaSalle County Station

GJD/JJT/lja

Enclosure

xc: Nuclear Licensing Administrator  
NRC Resident Inspector  
NRC Region III Administrator  
INPO - Records Center  
IDNS Resident Inspector

\*\*\* END OF DOCUMENT \*\*\*

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